AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A gas flow simulation method comprising ~~the steps of~~:

forming an object having at least one concavity on a surface thereof by ~~means of~~ a computer and extracting a part of said surface of said object including said concavity;

forming a spatial part from a space located on ~~the~~a periphery of said object ~~by dividing a portion of said spatial part~~ in contact with said extracted surface of said object ~~into blocks~~;

~~forming a large number~~ dividing said spatial part into a plurality of lattice-shaped portions ~~by dividing said spatial part into lattices~~;

flowing a gas into said spatial part in one direction along said surface of said object and discharging said gas in a different direction through an inside of said spatial part;

computing a motion element of a flow of said gas for each lattice-shaped portion of said spatial part; and

simulating a flow of said gas on the periphery of said concavity,

wherein a height of each of said lattice-shaped portions located in a range less than $1/Re^{0.5}$ (Re is Reynolds number, Re = representative velocity×representative length/kinematic viscosity of gas) with respect to said surface of said object is set to not less than $1/(1000 \cdot Re^{0.5})$ nor more than $1/Re^{0.5}$, and said height of each of said lattice-shaped portions located in a range not less than $1/Re^{0.5}$ with respect to said surface of said object is set to not less than $1/Re^{0.5}$.

2. (Original) The gas flow simulation method according to claim 1, wherein said motion element of said gas flow is a velocity of said gas flow, a direction of said gas flow, and a pressure of said gas flow applied to said surface of said object in each axial direction of a three-dimensional space coordinate system, and

said motion element is computed at each slight time dt by using the equation of continuity and the Navier-Stokes equation.

3. (Original) The gas flow simulation method according to claim 1, wherein based on a result of said computation, a gas flow on the periphery of said concavity is simulated by visualizing a flow direction of said gas flow and a flow velocity thereof by a vector direction and a vector length respectively.

4. (Original) The gas flow simulation method according to claim 1, wherein based on a result of said computation, a gas flow on the periphery of said concavity is simulated by visualizing a pressure distribution of said gas flow by an isobaric line or a surface connecting equal pressures to each other.

5. (Original) The gas flow simulation method according to claim 1, wherein based on a result of said computation, a gas flow on the periphery of said concavity is simulated by visualizing a vorticity distribution of said gas flow by an isopleth of equal vorticities or a surface connecting equal vorticities to each other.

6. (Original) The gas flow simulation method according to claim 1, wherein based on a result of said computation, a gas flow on the periphery of said concavity is simulated by visualizing a stream line, a trajectory, and a particle trace of said gas flow.

7. (Original) The gas flow simulation method according to claim 1, wherein a height of said spatial part with respect to said surface of said object is set to more than 10 times as large as a depth of said concavity nor more than 10000 times as large as said depth thereof.

8. (Canceled).

9. (Original) The gas flow simulation method according to claim 1, wherein said surface of said object is curved, and a flow direction of said gas which flows into said spatial part and discharged therefrom is corrected in conformity to a curvature of said surface of said object.

10. (Original) The gas flow simulation method according to claim 1, wherein said object is a golf ball, said concavity is a dimple, and a flow of a gas on the periphery of said dimple of said golf ball is simulated.

11. (New) The gas flow simulation method according to claim 1, wherein the height of the lattice-shaped portions gradually increases from the surface of the object to a height of the spatial part.

12. (New) The gas flow simulation method according to claim 1, wherein dividing the spatial part into a plurality of lattice-shaped portions further comprises dividing the spatial part into the plurality of the lattice-shaped portions combined with any combination of trigonal pyramid shaped portions, quadrangular pyramid shaped portions or trigonal prism shaped portions.

13. (New) A computer program product configured to execute computer instructions, comprising:

a first computer code configured to form an object having at least one concavity on a surface thereof an extract a part of said surface of said object including said concavity;

a second computer code configured to form a spatial part from a space located on a periphery of said object in contact with said extracted surface of said object;

a third computer code configured to divide said spatial part into a plurality of lattice-shaped portions;

a fourth computer code configured to flow a gas into said spatial part in one direction along said surface of said object and to discharge said gas in a different direction through an inside of said spatial part;

a fifth computer code configured to compute a motion element of a flow of said gas for each lattice-shaped portion of said spatial part; and

a sixth computer code configured to simulate a flow of said gas on the periphery of said concavity,

wherein a height of each of said lattice-shaped portions located in a range less than $1/Re^{0.5}$ (Re is Reynolds number, Re = representative velocity×representative length/kinematic viscosity of gas) with respect to said surface of said object is set to not less than $1/(1000 \bullet Re^{0.5})$ nor more than $1/Re^{0.5}$, and said height of each of said lattice-shaped portions located in a range not less than $1/Re^{0.5}$ with respect to said surface of said object is set to not less than $1/Re^{0.5}$.

14. (New) The computer program product according to claim 13, wherein said motion element of said gas flow is a velocity of said gas flow, a direction of said gas flow, and a pressure of said gas flow applied to said surface of said object in each axial direction of a three-dimensional space coordinate system, and

said motion element is computed at each slight time dt by using the equation of continuity and the Navier-Stokes equation.

15. (New) The computer program product according to claim 13, wherein based on a result of said computation, a gas flow on the periphery of said concavity is simulated by visualizing a flow direction of said gas flow and a flow velocity thereof by a vector direction and a vector length respectively.

16. (New) The computer program product appaaratus according to claim 13, wherein based on a result of said computation by said fifth computer code, a gas flow on the periphery of said concavity is simulated by visualizing a pressure distribution of said gas flow by an isobaric line or a surface connecting equal pressures to each other.

17. (New) The computer program product according to claim 13, wherein based on a result of said computation by said fifth computer code, a gas flow on the periphery of said concavity is simulated by visualizing a vorticity distribution of said gas flow by an isopleth of equal vorticities or a surface connecting equal vorticities to each other.

18. (New) The computer program product according to claim 13, wherein based on a result of said computation by said fifth computer code, a gas flow on the periphery of said concavity is simulated by visualizing a stream line, a trajectory, and a particle trace of said gas flow.

19. (New) The computer program product according to claim 13, wherein a height of said spatial part with respect to said surface of said object is set to more than 10 times as large as a depth of said concavity nor more than 10000 times as large as said depth thereof.

20. (New) The computer program product according to claim 13, wherein said surface of said object is curved, and a flow direction of said gas which flows into said spatial part and discharged therefrom is corrected in conformity to a curvature of said surface of said object.

21. (New) The computer program product according to claim 13, wherein said object is a golf ball, said concavity is a dimple, and a flow of a gas on the periphery of said dimple of said golf ball is simulated.

22. (New) The computer program product according to claim 13, wherein the height of the lattice-shaped portions gradually increases from the surface of the object to a height of the spatial part.

23. (New) The computer program product according to claim 13, wherein third computer code divides the spatial part into the plurality of the lattice-shaped portions combined with any combination of trigonal pymarid shaped portions, quadrangular pyramid shaped portions or trigonal prism shaped portions.